

TEST REPORT

No. AE18-0021802-01

MEASUREMENT OF CONDUCTED EMISSIONS

performed in accordance with

☒ EN 55032:2015

PRODUCT	USB power supply
MODEL TESTED	USB 2.4 A
TRADE MARK	4 BOX
APPLICANT	4 BOX S.r.l. – V.le Pasubio 6A – I-20154 Milano

Tested by	Renato Foschi <i>[Laboratory Technician]</i>	
Approved by	Giovanni Di Turi <i>[Laboratory manager]</i>	

Revision Sheet

Release No.	Date	Revision Description
Rev. 0	2018-03-14	First edition Digital signed_AE18-0021802-01_TR_EN 55032 2015_4 BOX_USB PS_USB 2.4 A

The results of tests and checks reported in this Test Report refer exclusively to the samples tested and described in the Report itself.

This Report shall not be reproduced partially the written approval of IMQ S.p.A..

The authenticity of this Test Report and its contents can be verified by contacting IMQ S.p.A., responsible for this Test Report.

1. GENERAL DATA

SAMPLE		
Samples received on	2018-01-22	(Item(s) sampled and sent by applicant)
IMQ reference samples	BEM	89387
Samples tested No.	1	
Object under analysis recognition	Not carried out	
Remark:	Except where stated, characteristics of products were taken from client description and were not verified by the laboratory	
TEST LOCATION		
Testing dates	2018-02-19	
Testing laboratory	IMQ S.p.A. - Via Quintiliano, 43 – I-20138 Milano	
Testing site	Via Quintiliano, 43 – I-20138 Milano Viale Lombardia, 20 – I-20021 Bollate (MI)	
ENVIRONMENTAL CONDITIONS		
Parameter	Range	
Ambient Temperature	20 ÷ 25 °C	
Relative Humidity	50 ÷ 60 %	
Atmospheric Pressure	900 ÷ 1000 mbar	
The laboratory is monitored by a continuous environmental conditions measurements system. Temperature, humidity and pressure data are recorded on a weekly basis and stored in local archive.		
REMARKS		
Throughout this report a point (comma) is used as the decimal separator. The ability or reliability of this product to perform its intended function in a particular application has not been investigated. Unless otherwise specified, warnings, installation instruction and/or user manual provided with the sample have been checked in Italian or English version only. IMQ declines any responsibility derived from missing or wrong information provided aside by the applicant.		

2. REFERENCE DOCUMENT

	DOCUMENT	DATE	TITLE
<input checked="" type="checkbox"/>	EN 55032	2015	Electromagnetic compatibility of multimedia equipment – Emission Requirements

3. EQUIPMENT UNDER TEST (EUT) DETAILS

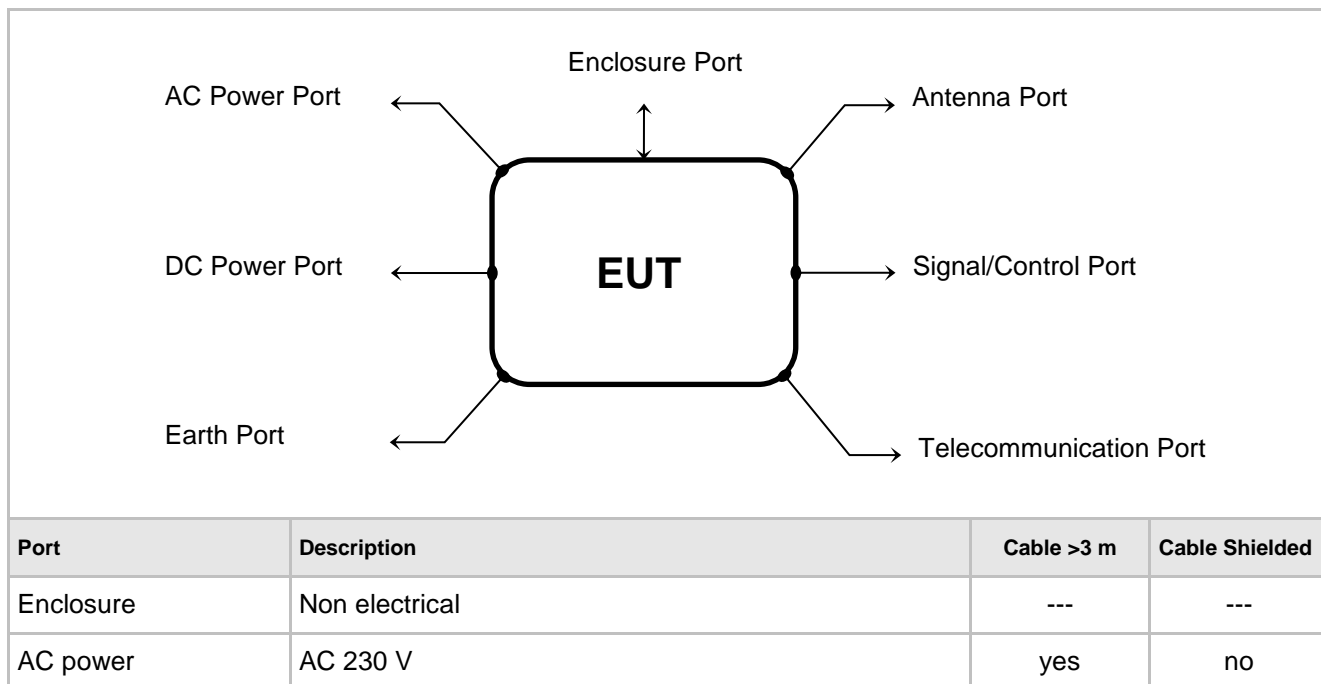
MODEL (basic)	Description
USB 2.4 A	USB power supply

MANUFACTURER	4 BOX S.r.l. – V.le Pasubio 6A – I-20154 Milano
ASSEMBLY PLANT	

EUT IDENTIFICATION

EUT type	USB power supply		
EUT classification	Multimedia equipment		
EUT use	<input checked="" type="checkbox"/> Fixed	<input type="checkbox"/> Vehicular	<input type="checkbox"/> Portable
EUT single or system	<input checked="" type="checkbox"/> Single	<input type="checkbox"/> System	
EUT standing	Wall		
Supply voltage	AC 230 V		
Frequency	50 Hz		
Power	---		
Ambient rating	---		

EUT PORTS



MODE OF OPERATION DURING THE TESTS

Ref.	Mode	Description
#1	Normal operation	USB active. Resistive load connected

SUPPORT EQUIPMENT

Defined as equipment needed for correct operation or loading of the EUT, but not considered as tested:

Equipment	Manufacturer	Model
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ELECTROMAGNETICALLY RELEVANT COMPONENTS

Component	No.	Manufacturer	Model
Electronic board	1	---	---

RFI SUPPRESSION DEVICES

Component	No.	Manufacturer	Model
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EMI PROTECTION DEVICES

Component	No.	Manufacturer	Model
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EUT TECHNICAL DOCUMENTATION

Document	Reference
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4. SUMMARY OF TEST RESULTS

POSSIBLE TEST CASE VERDICTS:	
Test object meets the requirement	PASS
Test object does not meet the requirement	FAIL
Test case does not apply to the test object	N.A.
Test not performed	N.P.

REQUIREMENT – TEST	COMMENTS	VERDICT
Classification of ITE (Class A or B)	Class B	-
Conducted emission	---	PASS
Radiated emission	----	PASS

5. RESULTS

5.1 MEASUREMENT OF CONDUCTED EMISSIONS AT MAINS TERMINALS

TEST REQUIREMENT			
Reference standard		EN 55032	
Measurement Method		According to ANNEX C clause C 3.5	
IMQ operational instruction		IO-80-P10 + IO-80-P11	
Deviation to test procedure		None	
EUT operating condition		#1	
Testing dates		2018-02-19	
Limits for Class B			
Frequency range (MHz)	Limit dB(μV)	Comments	Result
0.15 ÷ 0.5	66 ÷ 56 Quasi-Peak 56 ÷ 46 Average	Decreasing linearly with logarithm of frequency	PASS PASS
0.5 ÷ 5	56 Quasi-Peak 46 Average		PASS PASS
5 ÷ 30	60 Quasi-Peak 50 Average		PASS PASS

REMARKS
Detailed diagram results are showed in Annex A. The measurements with Quasi-Peak detector are performed only for frequencies for which the Peak values are ≥ (Q.P. limit - 6 dB).

5.2 MEASUREMENT OF RADIATED EMISSIONS

TEST REQUIREMENT				
Reference standard		EN 55032		
Measurement Method		According to ANNEX I clause 1.2		
IMQ operational instruction		IO-80-P10 + IO-80-P11		
Deviation to test procedure		None		
EUT operating condition		#1		
Testing dates		2018-02-19		
Port	Frequency (MHz)	Limit dB(μV/m)	Comments	Results
Enclosure	30 ÷ 230	40 Quasi-Peak	Since the measurement distance is reduced at 3 meter, the limits are increased by a factor of 10 dB	PASS
	230 ÷ 1000	47 Quasi-Peak		PASS
REMARKS				
Detailed diagram results are showed in Annex B. The tested sample results within the permitted limits.				

6. TESTS UNCERTAINTY

Unless otherwise stated the uncertainties for the tests and measurements are evaluated in according to IMQ Operational Instruction IO-LAB-001 and IO-LAB-004.

The expanded uncertainty was calculated for all measurements and tests listed in this test report according to CISPR 16-4-2 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainty in EMC Measurements", with UKAS document LAB 34 and is documented in the quality system accordance to ISO/IEC 17025.

Internal Procedure PG-037 ensures that the requirements for traceability of calibrations, of all test equipment requiring calibration, and calibration intervals are met.

7. MEASUREMENT EQUIPMENT AND INSTRUMENTATION

MEASUREMENT OF CONDUCTED EMISSION			
Instrument	Manufacturer	Model	IMQ Ref.
Shielded chamber	/	/	P-02391
EMI Receiver	ROHDE & SCHWARZ	ESU 8	S-05562
LISN 1 phase	ROHDE & SCHWARZ	ENV216	S-03631
ISN network	ROHDE & SCHWARZ	ENY41	S-04970
Software	ROHDE & SCHWARZ	EMC 32 Vers. 8.30	W-00124-ME+
PC	/	/	H-00098

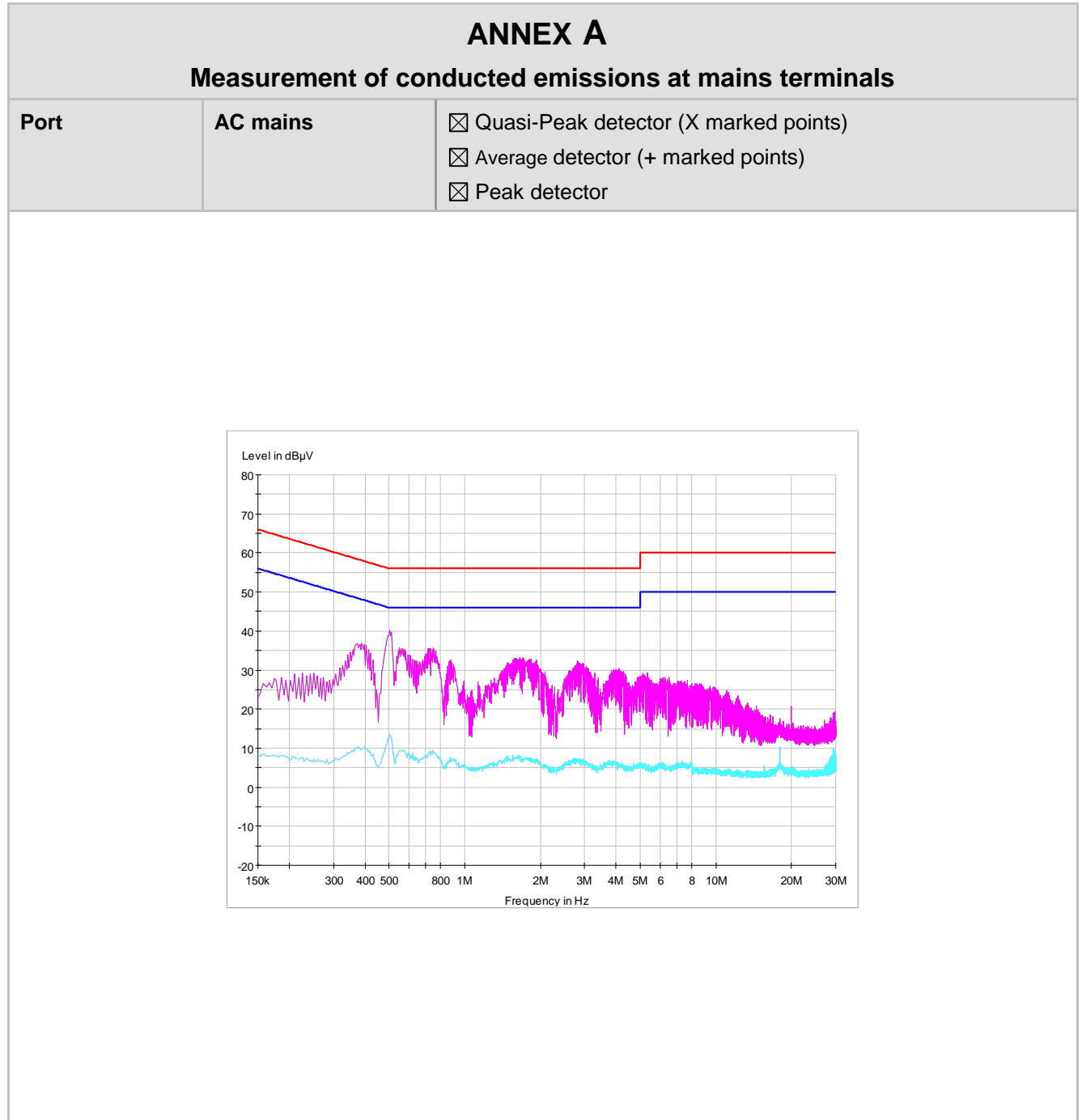
MEASUREMENT OF RADIATED EMISSION			
Instrument	Manufacturer	Model	IMQ Ref.
Shielded semi-anechoic chamber	SIDT	/	P-01709
Turntable controller unit	FRANKONIA	FCTAM01	P-02486
Mast antenna	FRANKONIA	FAM4	P-02488
EMI Receiver	ROHDE & SCHWARZ	ESCI 7	S-05563
Bi-Log antenna	SCHWARZBECK	VULB9160	S-06463
Horn antenna	SCHWARZBECK	BBHA 9120D	S-04272
Pre-amplifier 1-26GHz	HEWLETT PACKARD	HP 8439 B	S-03542
EMI cable	/	EMI1 RG 214/U	S-05040
EMI cable	/	EMI2 RG 214/U	S-05041
Software	ROHDE & SCHWARZ	EMC 32 Vers. 6.30	W-00199/E
PC	/	/	H-00165

8. PHOTOGRAPHIC DOCUMENTATION

EUT IDENTIFICATION



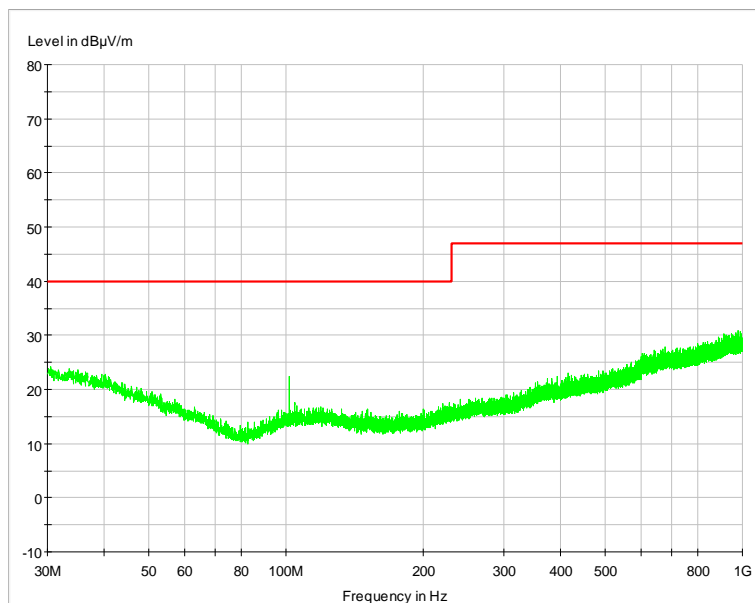
9. DIAGRAMS



ANNEX B

Measurement of radiated emissions

Port	Enclosure	<input checked="" type="checkbox"/> Quasi-Peak detector (X marked points) <input checked="" type="checkbox"/> Average detector (+ marked points) <input checked="" type="checkbox"/> Peak detector
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10. OPINIONS AND INTERPRETATIONS - NOT OBJECT TO ACCREDITIA ACCREDITATION

Not Applicable

END OF TEST REPORT